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PATENT ABSTRACTS OF JAPAN

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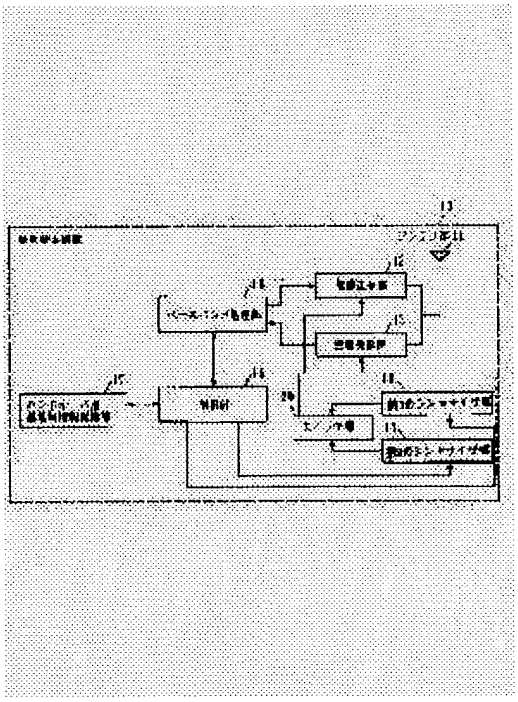
(72)Inventor : **SUGITANI TOSHIYUKI**
ABE TOSHIYUKI
OBUCHI KEN

(54) MOBILE TERMINAL AND HAND-OVER METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a mobile terminal and a hand-over method in which a hand-over processing time sand a momentary interruption time of an information channel TCH during communication are reduced.

SOLUTION: A mobile terminal that conducts hand-over in a time division multiple access(TDMA)/time division duple(TDD) system is provided with an antenna section 11, a radio transmission section 12, a radio reception section 13, a base band processing section 14 that conducts the analysis processing of a signal obtained by receiving a radio signal at the radio reception section 13, the synchronization processing of a TDMA frame, an output of transmission data to the radio transmission section 12 or detection of the received signal level, a hand-over base station information storage section 17 that stores base station information for hand-over processing, a synthesizer section 16 for a local oscillator and a control section 15 for the entire sections. The control section conducts logical control channel searching by using idle slots other than an information channel communicating slot and adjacent slots to the above slot during communication.



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[Patent number]

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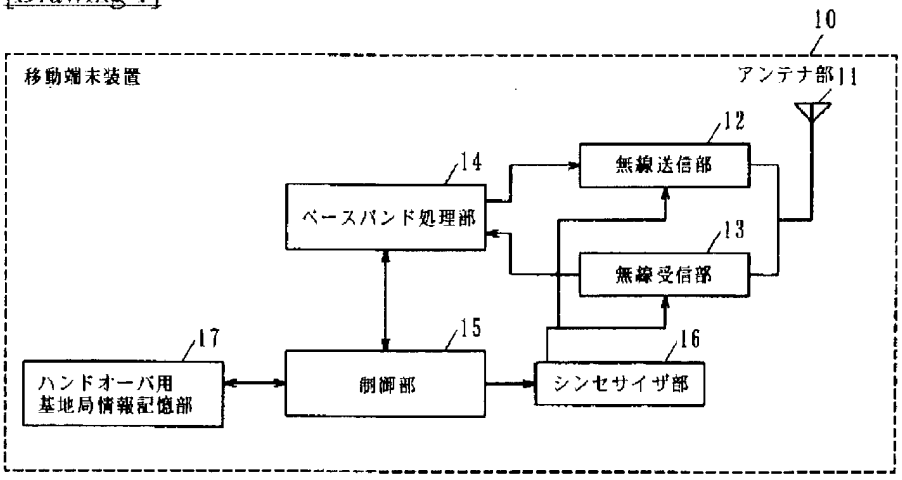
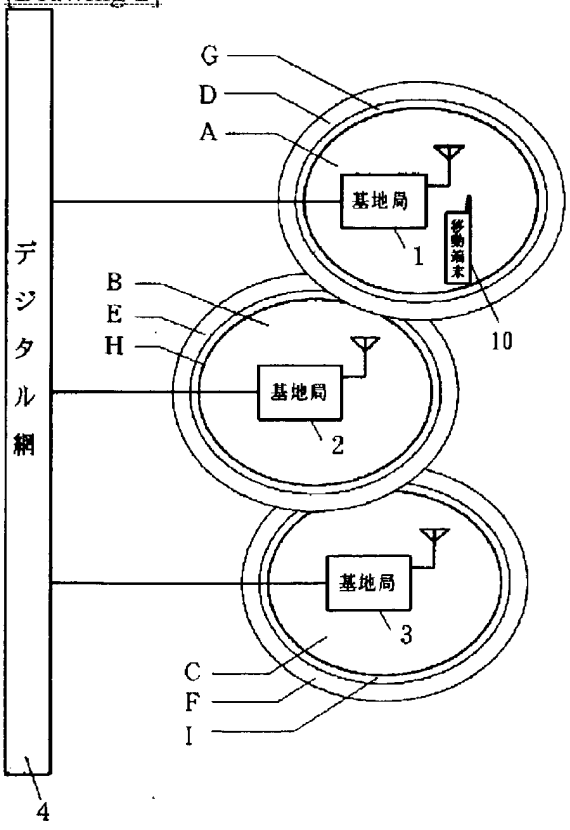
DRAWINGS

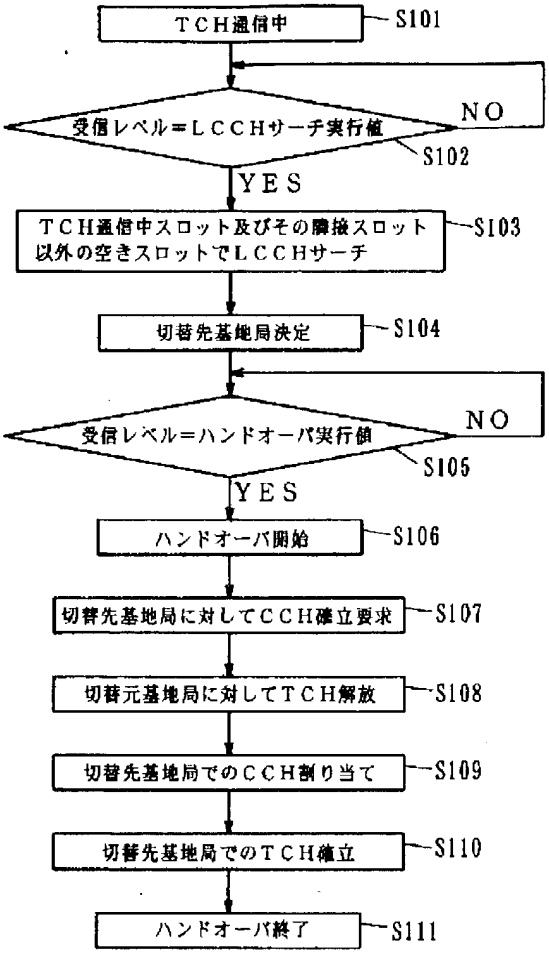
[Drawing 1]



[Drawing 2]



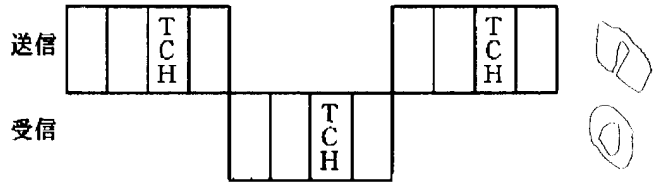
[Drawing 3]



[Drawing 4]

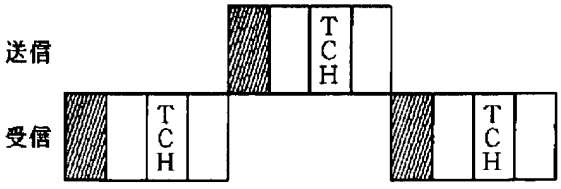
(a)

基地局



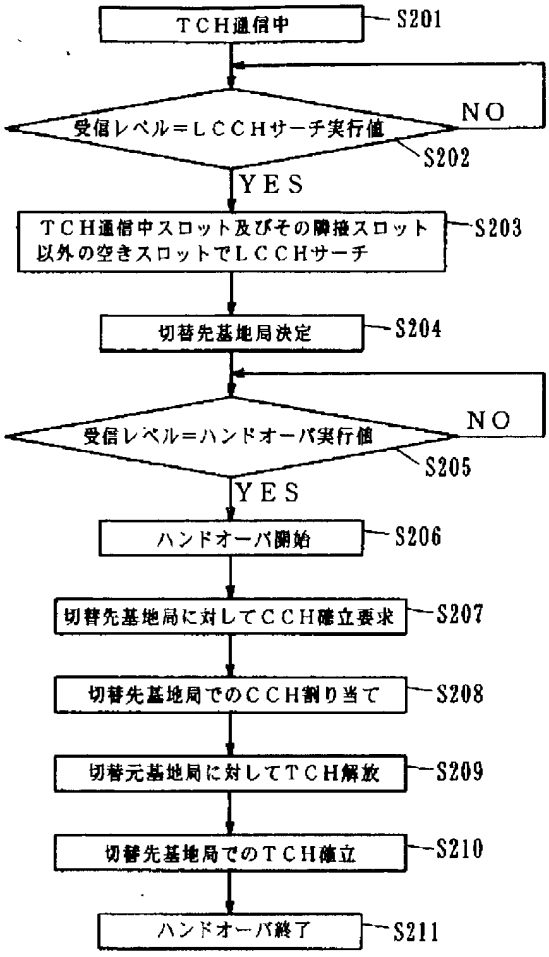
(b)

移動端末装置

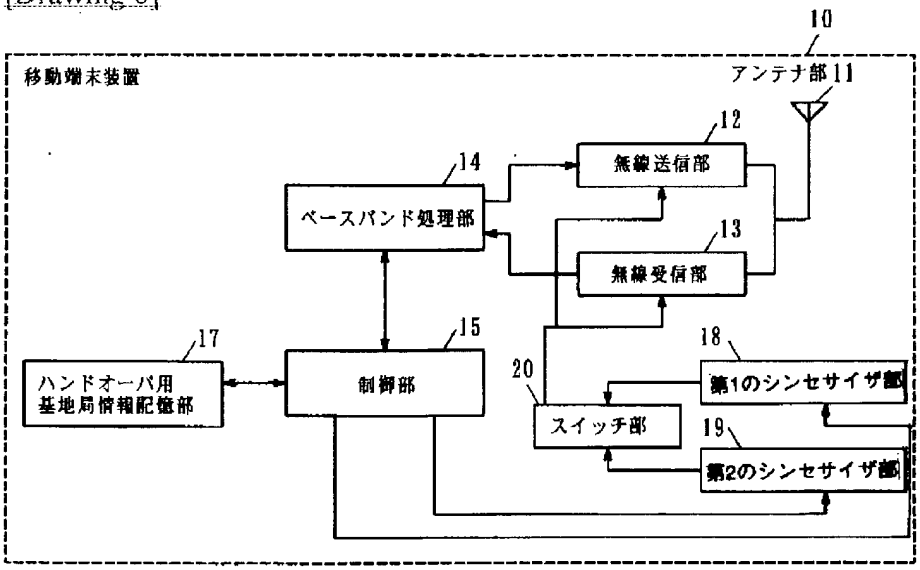


：ＬＣＣＨサーチ

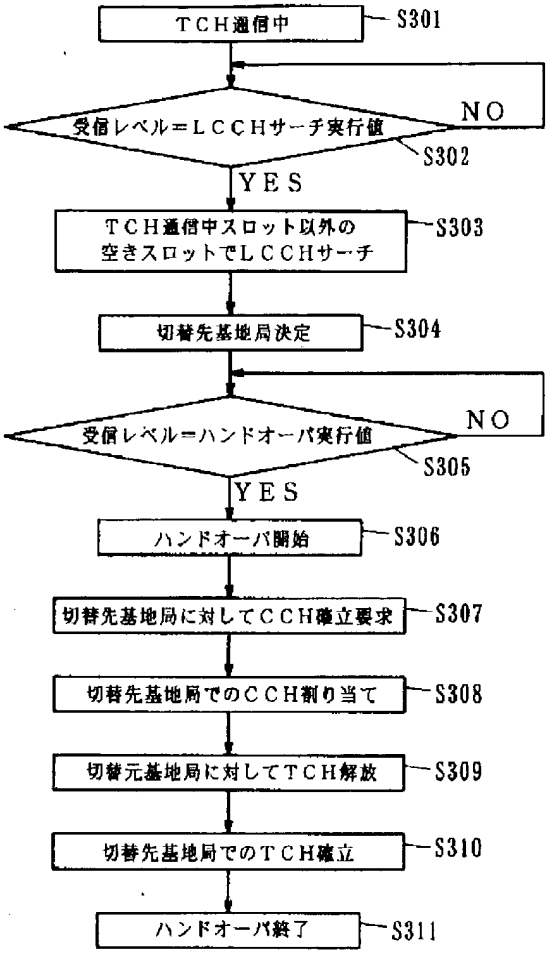
[Drawing 5]



[Drawing 6]



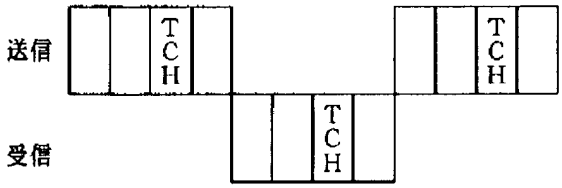
[Drawing 7]



[Drawing 8]

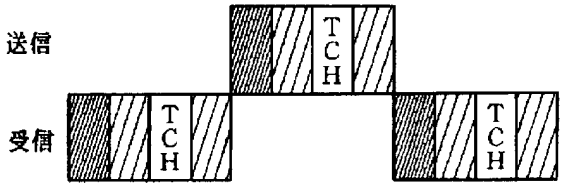
(a)

基地局



(b)

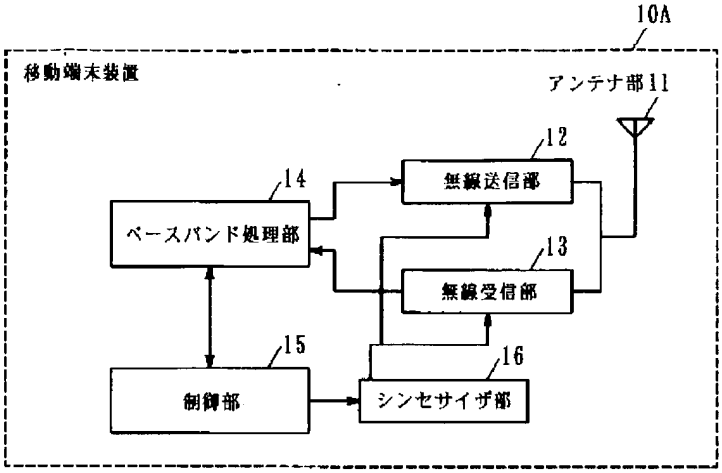
移動端末装置



：シンセサイザ部18でＬＣＣＨサーチ

：シンセサイザ部19でＬＣＣＨサーチ

[Drawing 11]



[Drawing 14]

(a)

基地局送信

送信3	送信1	送信2	送信3	送信1	送信2	送信3	送信1

(b)

基地局受信

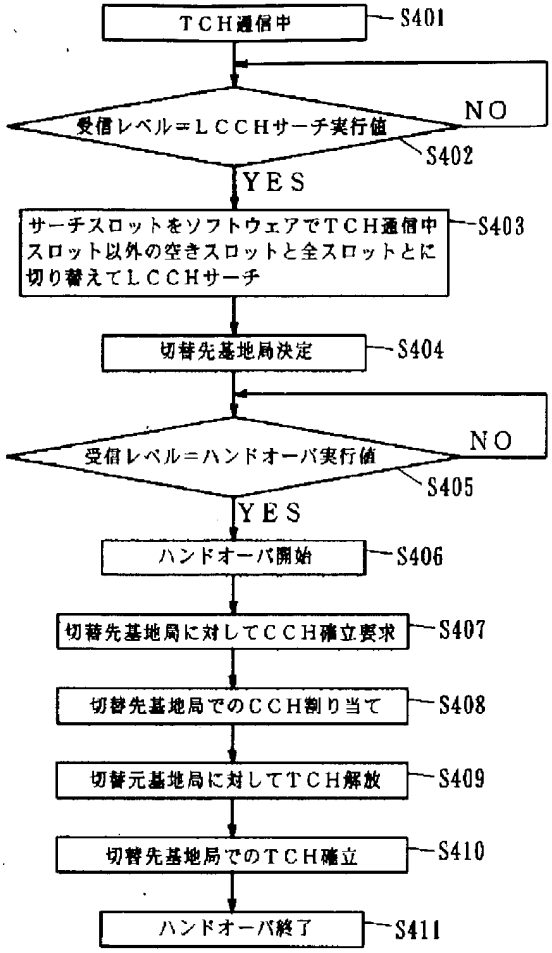
受信1	受信2	受信3	受信1	受信2	受信3	受信1	受信2

(c)

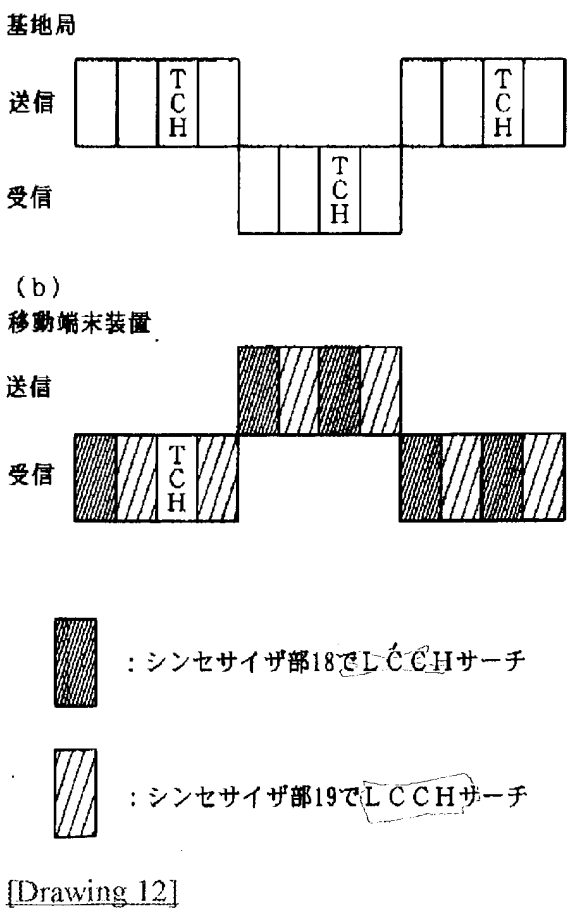
移動端末装置

送信1	受信1	アイドル	送信1	受信1	アイドル	送信1	受信1

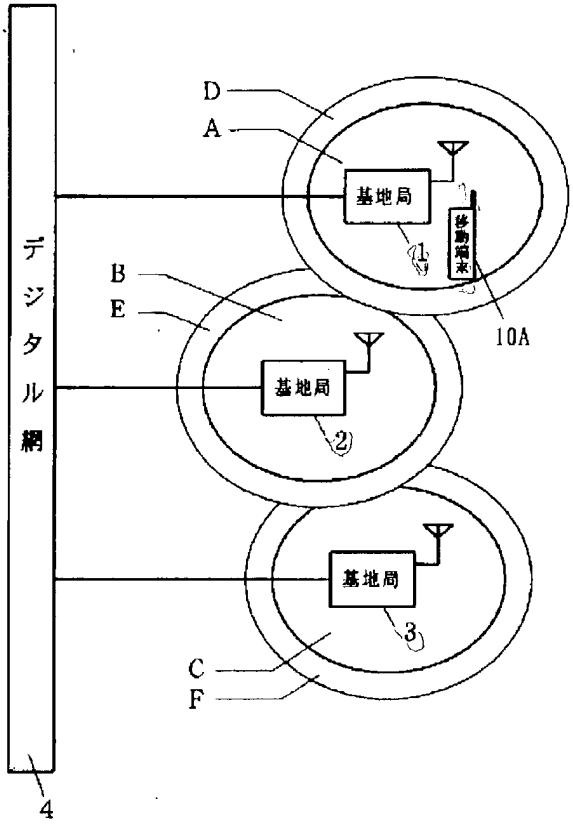
[Drawing 9]



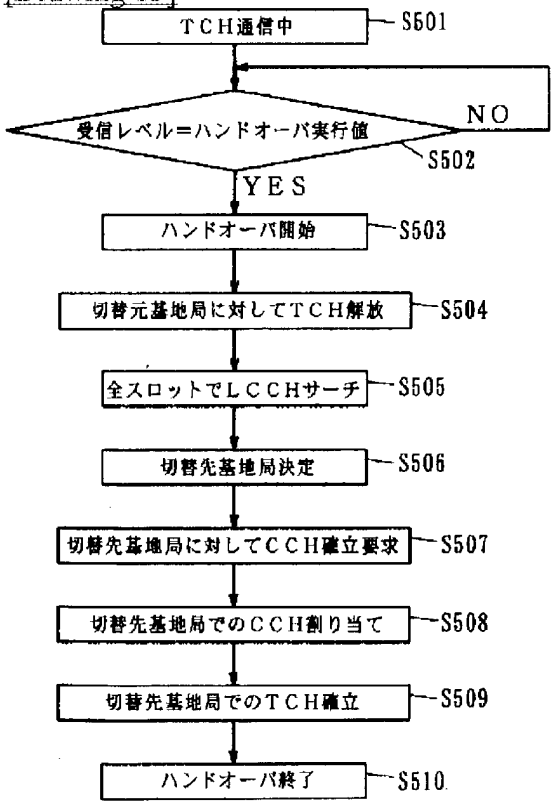
[Drawing 10]



[Drawing 12]



[Drawing 13]



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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the migration terminal unit using TDMA (Time Division Multiple Access) / TDD (Time Division Duplex) method, and the handover approach in the migration terminal unit.
[0002]
[Description of the Prior Art] In recent years, digitization of a land mobile radiotelephone system or a cellular-phone system is progressed, in digital mobile communications, two or more radio stations divide one frequency in time, and share it, and the TDMA/TDD method which realizes bidirectional transmission on the transmission line of a pair is becoming in use. The TDMA/TDD method is adopted also in current and PHS (Personal Handy-phone System) which has spread quickly.
[0003] Drawing 11 is the block diagram showing the migration terminal unit of the conventional PHS in a TDMA/TDD method. 10A is a migration terminal unit and this migration terminal unit 10A consists of the antenna section 11, the wireless transmitting section 12, the wireless receive section 13, the baseband processing section 14, a control section 15, and the synthesizer section 16.
[0004] Next, the function of each part is explained. The antenna section 11 transmits and receives a radio signal. The wireless transmitting section 12 performs transmitting processing of transmit data, and the wireless receive section 13 performs reception of the radio signal received in the antenna section 11. The baseband processing section 14 performs output of analysis processing of the input signal which received the radio signal and was obtained in the wireless receive section 13, synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section 12, or detection of a received signal level. A control section 15 controls the whole migration terminal unit 10A. The SHINSASEIZA section 16 is a local oscillator and supplies an oscillation signal to the wireless transmitting section 12 and the wireless receive section 13.
[0005] Thus, about the constituted migration terminal unit, the actuation is explained using drawing 12 - drawing 14. Drawing 12 is the explanatory view of operation showing handover actuation of PHS, and flow chart and drawing 14 (a) - (c) drawing 13 indicates the handover operations sequence of PHS to be is the transceiver timing chart of TDMA / TDD method. In drawing 12 , the speech quality good zone where in 1-3 the migration terminal unit of drawing 11 offers a digital network and 10A, and, as for a base station and 4, each base stations 1-3 offer A-C, and D-F are handover zones which each base stations 1-3 offer.
[0006] When migration (S501) terminal unit 10A which was communicating in the speech quality good zone A of a base station 1 moves to the handover zone D in drawing 12 and drawing 13 , Migration terminal unit 10A Receiving level degradation of TCH (information channel) of a base station 1, Receiving quality degradation is judged (S502, S503), TCH (information channel) of a base station 1 is released (S504), LCCH (logic control channel) of another base station 2 and a base station 3 is searched (S505), and, as a result, the optimal change place base station 2 is caught (S506). To the optimal change place base station 2, migration terminal unit 10A establishes TCH (information channel) with the change place base station 2 for a CCH (control channel) establishment demand, after [delivery (S507) and the change place base station 2] assigning CCH (control channel) (S508), it ends a handover (S509) (S510), and continues a communication link in the speech quality good zone B of the change place base station 2.
[0007] however, by the above approaches, in order that migration terminal unit 10A of drawing 12 may release TCH (information channel) of a base station 1 immediately after judging receiving level

degradation of TCH (information channel) of a base station 1, and receiving quality degradation, pass a LCCH (logic control channel) search from the time -- the processing time to handover termination of TCH (information channel) establishment with the change place base station 2 turns into hits time amount of TCH (information channel) during the communication link of migration terminal unit 10A. It was the important technical problem of the handover from the former how this hits time amount can be shortened.

[0008] Moreover, in the digital cellular cellular phone of a TDMA/TDD method, in the case of three-channel TDMA, as shown in drawing 14 (c), a migration terminal unit takes a slot configuration in order of a transmitting slot, a receiving slot, and an idle. That is, an idle can be set up during a communication link using the empty slot which is not used for transmission and reception of TDMA, the receiving level of the signal from two or more circumference base stations can be measured to coincidence, and a migration place base station can be selected.

[0009]

[Problem(s) to be Solved by the Invention] However, in the migration terminal unit of the conventional PHS, taking the slot configuration which includes an idle setup like the digital cellular cellular phone of a TDMA/TDD method had the trouble of being difficult.

[0010] By this migration terminal unit and the handover approach, it is required that the handover processing time of the migration terminal unit in a TDMA/TDD method should be shortened.

[0011] This invention aims at offering the handover approach in the migration terminal unit of TDMA / TDD method use which can shorten the handover processing time in a TDMA/TDD method, and can shorten the hits time amount of TCH (information channel) during a communication link, and the migration terminal unit of TDMA/TDD method use.

[0012]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem the migration terminal unit of this invention The antenna section which is the migration terminal unit which performs the handover in TDMA / TDD method, and transmits and receives a radio signal, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, It has the base station information storage section for handovers which memorizes base station information to handover processing, the synthesizer section for local oscillators, and the control section which performs the whole control. A control section It has the configuration which performs a logic control channel search by empty slots other than the contiguity slot of a slot during a slot and an information-channel communication link during an information-channel communication link during a communication link.

[0013] The migration terminal unit of TDMA/TDD method use which can shorten the handover processing time of the migration terminal unit in a TDMA/TDD method, and can shorten the hits time amount of TCH (information channel) during the communication link of a migration terminal by this is obtained.

[0014] The handover approach in the migration terminal unit of this invention for solving the above-mentioned technical problem It is the handover approach in the migration terminal unit using the TDMA/TDD method which has the service area which consists of two or more zones, and can connect with the base station for every zone. When the synchronization can be taken in two or more base stations, in case a migration terminal unit carries out a handover, a migration terminal judges receiving level degradation and receiving quality degradation. The change place base station prehension step which performs a logic control channel search in the empty slot which is not used for the communication link of TDMA at the time of a value higher than the receiving input-level value which performs a handover, and catches the optimal change place base station, The changing agency base station release step which releases an information channel with a changing agency base station after advancing a control channel establishment demand to the optimal change place base station caught beforehand, when a receiving input level becomes a handover effective value, After control channel assigning in a change place base station, it has the configuration which has the change place base station establishment step which performs information-channel establishment in a change place base station.

[0015] Thereby, the handover approach in the migration terminal unit of TDMA/TDD method use is acquired.

[0016]
[Embodiment of the Invention] The antenna section which the migration terminal unit of this invention according to claim 1 is a migration terminal unit which performs the handover in a TDMA/TDD method, and transmits and receives a radio signal, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, It has the base station information storage section for handovers which memorizes base station information to handover processing, the synthesizer section for local oscillators, and the control section which performs the whole control. A control section Suppose that a logic control channel search is performed by empty slots other than the contiguity slot of a slot during a slot and an information-channel communication link during an information-channel communication link during a communication link, and it sets during a communication link. It has an operation that a logic control channel search is performed by the slot and empty slots other than the contiguity slot during an information-channel communication link.
[0017] The antenna section which invention according to claim 2 is a migration terminal unit which performs the handover in a TDMA/TDD method, and transmits and receives a radio signal, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, The base station information storage section for handovers which memorizes base station information to handover processing, Have the switch section which changes the 1st synthesizer section for local oscillators, the 2nd synthesizer section, and the 1st synthesizer section and the 2nd synthesizer section, and the control section which performs the whole control, and a control section is set during a communication link. It supposes that a logic control channel search is performed by empty slots other than a slot during an information-channel communication link, and has an operation that a logic control channel search is performed by empty slots other than a slot during an information-channel communication link during a communication link.
[0018] The antenna section which invention according to claim 3 is a migration terminal unit which performs the handover in a TDMA/TDD method, and transmits and receives a radio signal, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, The base station information storage section for handovers which memorizes base station information to handover processing, The switch section which changes the 1st synthesizer section for local oscillators, the 2nd synthesizer section, and the 1st synthesizer section and the 2nd synthesizer section, It has the control section which controls the whole. A control section By changing to an information-channel communication link and a logic control channel search by software to a slot during an information-channel communication link It supposes that a logic control channel search is performed by all slots during a communication link, and has an operation that a logic control channel search is performed by all slots during a communication link.
[0019] The handover approach of this invention according to claim 4 It is the handover approach in the migration terminal unit using the TDMA/TDD method which has the service area which consists of two or more zones, and can connect with the base station for every zone. When the synchronization can be taken in two or more base stations, in case a handover is carried out, receiving level degradation and receiving quality degradation are judged. The change place base station prehension step which performs a logic control channel search in the empty slot which is not used for the communication link of TDMA at the time of a value higher than a receiving level value, and catches the optimal change place base station in case a handover is performed, The changing agency base station release step which releases an information channel with a changing agency base station after advancing a control channel establishment demand to the optimal change place base station caught beforehand, when a receiving input level becomes a handover effective value, It is supposed that it has the change place base station

establishment step which performs information-channel establishment in a change place base station after control channel assigning in a change place base station. It has an operation that delete the logic control channel search time spent on handover processing, and the hits time amount of an information channel is shortened during a communication link.

[0020] Invention according to claim 5 has the service area which consists of two or more zones. It is a handover method in the migration terminal unit using the TDMA/TDD method which can connect with the base station for every zone. When the synchronization can be taken in two or more base stations, in case a handover is carried out, receiving level degradation and receiving quality degradation are judged. The change place base station prehension step which performs a logic control channel search in the empty slot which is not used for the communication link of TDMA at the time of a value higher than the receiving input-level value which performs a handover, and catches the optimal change place base station, When a receiving input level becomes a handover effective value, a control channel establishment demand is advanced to the optimal change place base station caught beforehand. The changing agency base station release step which releases an information channel with a changing agency base station after control channel assigning in a change place base station, It is supposed that it has the change place base station establishment step which performs information-channel establishment in a change place base station. After control channel assigning in a change place base station, an information channel with a changing agency base station is released, and it has an operation that the hits time amount of an information channel is further shortened during a communication link.

[0021] Hereafter, the gestalt of operation of this invention is explained using drawing 1 - drawing 10 . (Gestalt 1 of operation) Drawing 1 is the block diagram showing the migration terminal unit by the gestalt 1 of operation of this invention.

[0022] In drawing 1 , since the antenna section 11, the wireless transmitting section 12, the wireless receive section 13, the baseband processing section 14, a control section 15, and the synthesizer section 16 are the same as that of drawing 11 , explanation is omitted. 17 is the base station information storage section for handovers, and the base station information storage section 17 for handovers memorizes base station information, such as a received signal level detected in the baseband processing section 14 to handover processing.

[0023] About the migration terminal unit constituted as mentioned above, handover actuation is explained using drawing 2 , drawing 3 , and drawing 4 . Drawing 2 is the explanatory view of operation showing handover actuation of PHS, and the flow chart with which drawing 3 shows the handover operations sequence of PHS, drawing 4 (a), and (b) are the transceiver timing charts of a TDMA/TDD method. In drawing 2 , since base stations 1-3, a digital network 4, speech quality good zone A-C, and handover zone D-F are the same as that of drawing 12 , the same sign is attached and explanation is omitted. It is the LCCH (logic control channel) search zone where the migration terminal unit of drawing 1 offers 10, and each base stations 1-3 offer G-I.

[0024] When the migration (S101) terminal 10 which was communicating in the speech quality good zone A of a base station 1 moves to the LCCH (logic control channel) search zone G in drawing 1 - drawing 3 , The receiving level of TCH (information channel) of a base station 1 is judged in the baseband processing section 14 (S102). A LCCH (logic control channel) search is performed in a slot and empty slots other than the contiguity slot during a TCH (information channel) communication link (S103, change place base station prehension step). By detecting the receiving level of LCCH (logic control channel) sent from the surrounding base station 2 and a base station 3 in the baseband processing section 14, memorizing the information in the base station information storage section 17 for handovers, and processing by the control section 15 The optimal change place base station 2 is caught (S104, change place base station prehension step). Here, when the number of the synthesizer sections is one, a LCCH (logic control channel) search slot turns into a slot and empty slots other than the contiguity slot during a TCH (information channel) communication link, because the contiguity slot of a slot cannot be used during a TCH (information channel) communication link because of transceiver preparation in the wireless sections 12 and 13 (refer to drawing 4).

[0025] When the migration terminal unit 10 moves to the handover zone D, the migration terminal unit 10 Next, receiving level degradation of TCH (information channel) of a base station 1, Receiving quality degradation is judged (S105, S106, changing agency base station release step). As opposed to the optimal change place base station 2 a CCH (control channel) establishment demand Delivery (S107, changing agency base station release step), TCH (information channel) of the changing agency base station 1 is released (S108, changing agency base station release step). After CCH (control channel) assigning in the change place base station 2 (S109, change place base station establishment step), TCH

(information channel) with the change place base station 2 is established, a handover (S110) is ended (S111), and a communication link is continued in the speech quality good zone B of the change place base station 2.

[0026] According to the gestalt of this operation, as mentioned above by performing a logic control channel search by empty slots other than the contiguity slot of a slot during a slot and an information-channel communication link during an information-channel communication link during a communication link Since an information channel with a changing agency base station is releasable after advancing a control channel establishment demand to the optimal change place base station caught beforehand The logic control channel search time spent on handover processing can be deleted, the handover processing time in a TDMA/TDD method can be shortened, and the hits time amount of TCH (information channel) can be shortened during a communication link.

[0027] (Gestalt 2 of operation) The configuration of the migration terminal unit by the gestalt 2 of operation of this invention is the same as that of drawing 1 , and the explanation is omitted. The places where the migration terminal unit by the gestalt 2 of operation differs from the gestalt 1 of operation are the function of a control section 15, and actuation.

[0028] Thus, about the constituted migration terminal unit, the handover actuation is explained using drawing 2 and drawing 5 . Drawing 5 is a flow chart which shows the handover operations sequence of PHS.

[0029] When the migration (S201) terminal unit 10 which was communicating in the speech quality good zone A of a base station 1 moves to the LCCH (logic control channel) search zone G in drawing 1 , drawing 2 , and drawing 5 , The receiving level of TCH (information channel) of a base station 1 is judged in the baseband processing section 14 (S202). A LCCH (logic control channel) search is performed in a slot and empty slots other than the contiguity slot during a TCH (information channel) communication link (S203, change place base station prehension step). By detecting the receiving level of LCCH (logic control channel) sent from the surrounding base station 2 and a base station 3 in the baseband processing section 14, memorizing the information in the base station information storage section 17 for handovers, and processing by the control section 15 The optimal change place base station 2 is caught (S204, change place base station prehension step). Here, when the number of the synthesizer sections is one, a LCCH (logic control channel) search slot turns into a slot and empty slots other than the contiguity slot during a TCH (information channel) communication link, because the contiguity slot of a slot cannot be used during a TCH (information channel) communication link because of transceiver preparation in the wireless section (refer to drawing 4).

[0030] Next, when the migration terminal unit 10 moves to the handover zone D, the migration terminal unit 10 judges receiving level degradation of TCH (information channel) of a base station 1, and receiving quality degradation (S205, S206, changing agency base station release step), and sends a CCH (control channel) establishment demand to the optimal change place base station 2 (S207, changing agency base station release step). Then, after CCH (control channel) assigning in the change place base station 2 (S208, changing agency base station release step), TCH (information channel) is released to the changing agency base station 1 (S209, changing agency base station release step). TCH (information channel) with the change place base station 2 is established, a handover (S210, change place base station establishment step) is ended (S211), and a communication link is continued in the speech quality good zone B of the change place base station 2.

[0031] Since the information channel with a changing agency base station was released according to the gestalt of this operation as mentioned above after control channel assigning in a change place base station, the hits time amount of an information channel can be further shortened during a communication link.

[0032] (Gestalt 3 of operation) Drawing 6 is the block diagram showing the migration terminal unit by the gestalt 3 of operation of this invention. In drawing 6 , since the antenna section 11, the wireless transmitting section 12, the wireless receive section 13, the baseband processing section 14, a control section 15, and the base station information storage section 17 for handovers are the same as that of drawing 1 , explanation is omitted. 18, the 1st as a local oscillator with which 19 supplies an oscillation signal to the wireless transmitting section 12 and the wireless receive section 13, the 2nd synthesizer section, and 20 are the switch sections which change the 1st and 2nd synthesizer section 18 and 19.

[0033] About the migration terminal unit constituted as mentioned above, handover operations sequence is explained using drawing 2 , drawing 7 , and drawing 8 . Drawing 7 is a flow chart which shows handover actuation of PHS, and drawing 8 (a) and (b) are the transceiver timing charts of TDMA/TDD. In addition, the migration terminal unit 10 in drawing 2 is a migration terminal unit of the same

configuration as drawing 6 .

[0034] When the migration terminal 10 (S301) which was communicating in the speech quality good zone A of a base station 1 moves to the LCCH (logic control channel) search zone G in drawing 2 , drawing 6 , and drawing 7 , The receiving level of TCH (information channel) of a base station 1 is judged in the baseband processing section 14 (S302). A LCCH (logic control channel) search is performed in empty slots other than a slot during a TCH (information channel) communication link (S303, change place base station prehension step). By detecting the receiving level of LCCH (logic control channel) sent from the surrounding base station 2 and a base station 3 in the baseband processing section 14, memorizing the information in the base station information storage section 17 for handovers, and processing by the control section 15 The optimal change place base station 2 is caught (S304, change place base station prehension step). Here, a LCCH (logic control channel) search slot turns into empty slots other than a slot during a TCH (information channel) communication link, because two synthesizers are independent (refer to drawing 8). That is, it is because transceiver preparation in the wireless sections 12 and 13 is unnecessary.

[0035] Next, when the migration terminal unit 10 moves to the handover zone D, the migration terminal unit 10 judges receiving level degradation of TCH (information channel) of a base station 1, and receiving quality degradation (S305, S306, changing agency base station release step), and sends a CCH (control channel) establishment demand to the optimal change place base station 2 (S307, changing agency base station release step). Assign CCH (control channel) (S308, changing agency base station release step), and TCH (information channel) is behind released to the changing agency base station 1 (S309, changing agency base station release step). then, the change place base station 2 -- TCH (information channel) with the change place base station 2 is established, a handover (S310, change place base station establishment step) is ended (S311), and a communication link is continued in the speech quality good zone B of the change place base station 2.

[0036] According to the gestalt of this operation, as mentioned above The 1st synthesizer section 18 for local oscillators, and the 2nd synthesizer section 19, The switch section which changes the 1st synthesizer section 18 and the 2nd synthesizer section 19 is prepared. A control section 15 By having been made to perform a logic control channel search by empty slots other than a slot during the communication link during the information-channel communication link Since a logic control channel search can be performed by empty slots other than a slot during an information-channel communication link during a communication link The handover processing time in TDMA / TDD method can be shortened, and the hits time amount of TCH (information channel) can be shortened during a communication link.

[0037] (Gestalt 4 of operation) The configuration of the migration terminal unit by the gestalt 4 of operation of this invention is the same as that of drawing 6 , and the explanation is omitted. The places where the migration terminal unit by the gestalt 4 of operation differs from the gestalt 3 of operation are the function of a control section 15, and actuation.

[0038] About the migration terminal unit constituted as mentioned above, handover actuation is explained using drawing 2 , drawing 9 , and drawing 10 . Drawing 9 is a flow chart which shows the handover operations sequence of PHS, and drawing 10 (a) and (b) are the transceiver timing charts of TDMA/TDD. In addition, the migration terminal unit 10 in drawing 2 is a migration terminal unit of the same configuration as drawing 6 .

[0039] When the migration (S401) terminal unit 10 which was communicating in the speech quality good zone A of a base station 1 moves to the LCCH (logic control channel) search zone G in drawing 2 , drawing 6 , and drawing 9 , The receiving level of TCH (information channel) of a base station 1 is judged in the baseband processing section 14 (S402). Change to a TCH (information channel) communication link and a LCCH (logic control channel) search by software to a slot during a TCH (information channel) communication link (refer to drawing 10), and it sets during a communication link. A LCCH (logic control channel) search is performed by all slots (S403, change place base station prehension step). By detecting the receiving level of LCCH (logic control channel) sent from the surrounding base station 2 and a base station 3 in the baseband processing section 14, memorizing the information in the base station information storage section 17 for handovers, and processing by the control section 15 The optimal change place base station 2 is caught (S404, change place base station prehension step).

[0040] Next, when the migration terminal unit 10 moves to the handover zone D, the migration terminal unit 10 judges receiving level degradation of TCH (information channel) of a base station 1, and receiving quality degradation (S405, S406, changing agency base station release step), and sends a CCH

(control channel) establishment demand to the optimal change place base station 2 (S407, changing agency base station release step). Then, after CCH (control channel) assigning in the change place base station 2 (S408, changing agency base station release step), TCH (information channel) is released to the changing agency base station 1 (S409, changing agency base station release step). TCH (information channel) with the change place base station 2 is established, a handover (S410, change place base station establishment step) is ended (S411), and a communication link is continued in the speech quality good zone B of the change place base station 2.

[0041] As mentioned above, according to the gestalt of this operation, since a logic control channel search can be performed by all slots during a communication link by changing to an information-channel communication link and a logic control channel search by software to a slot during an information-channel communication link, a control section 15 can respond, also when the synchronization of base stations cannot be taken.

[0042]

[Effect of the Invention] The antenna section which is the migration terminal unit which performs the handover in a TDMA/TDD method, and transmits [according to the migration terminal unit of this invention according to claim 1] and receives a radio signal as mentioned above, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, It has the base station information storage section for handovers which memorizes base station information to handover processing, the synthesizer section for local oscillators, and the control section which performs the whole control. A control section By performing a logic control channel search by empty slots other than the contiguity slot of a slot during a slot and an information-channel communication link during an information-channel communication link during a communication link Since an information channel with a changing agency base station is releasable after advancing a control channel establishment demand to the optimal change place base station caught beforehand The advantageous effectiveness that the logic control channel search times spent on handover processing can be reduced, the handover processing time in a TDMA/TDD method can be shortened, and the hits time amount of an information channel can be shortened during a communication link is acquired.

[0043] The antenna section which according to invention according to claim 2 is the migration terminal unit which performs the handover in a TDMA/TDD method, and transmits and receives a radio signal, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, The base station information storage section for handovers which memorizes base station information to handover processing, Have the switch section which changes the 1st synthesizer section for local oscillators, the 2nd synthesizer section, and the 1st synthesizer section and the 2nd synthesizer section, and the control section which performs the whole control, and a control section is set during a communication link. By performing a logic control channel search by empty slots other than a slot during an information-channel communication link The advantageous effectiveness that the logic control channel search times spent on handover processing can be reduced efficiently, the handover processing time in a TDMA/TDD method can be shortened, and the hits time amount of an information channel can be shortened during a communication link is acquired.

[0044] The antenna section which according to invention according to claim 3 is the migration terminal unit which performs the handover in a TDMA/TDD method, and transmits and receives a radio signal, With the wireless receive section which performs reception of the radio signal received in the antenna section Analysis processing of the input signal which received the radio signal and was obtained in the wireless transmitting section which performs transmitting processing of transmit data, and a wireless receive section, The baseband processing section which performs output of synchronous processing of the TDMA frame, and the transmit data to the wireless transmitting section, or detection of a received signal level, The base station information storage section for handovers which memorizes base station information to handover processing, The switch section which changes the 1st synthesizer section for local oscillators, the 2nd synthesizer section, and the 1st synthesizer section and the 2nd synthesizer

section, It has the control section which controls the whole. A control section Change to an information-channel communication link and a logic control channel search by software to a slot during an information-channel communication link, and it sets during a communication link. Since a logic control channel search can be performed by all slots during a communication link by performing a logic control channel search by all slots, the advantageous effectiveness that it can respond also when the synchronization of base stations cannot be taken is acquired.

[0045] According to the handover approach of this invention according to claim 4, it has the service area which consists of two or more zones. It is the handover approach in the migration terminal unit using the TDMA/TDD method which can connect with the base station for every zone. When the synchronization can be taken in two or more base stations, in case a handover is carried out, receiving level degradation and receiving quality degradation are judged. The changing agency base station prehension step which performs a logic control channel search in the empty slot which is not used for the communication link of TDMA at the time of a value higher than the receiving input-level value which performs a handover, and catches the optimal change place base station, The changing agency base station release step which releases an information channel with a changing agency base station after advancing a control channel establishment demand to the optimal change place base station caught beforehand, when a receiving input level becomes a handover effective value, By having the change place base station establishment step which performs information-channel establishment in a change place base station after control channel assigning in a change place base station The advantageous effectiveness that the logic control channel search time spent on handover processing can be deleted, and the hits time amount of an information channel can be shortened during a communication link is acquired.

[0046] According to invention according to claim 5, it has the service area which consists of two or more zones. It is the handover approach in the migration terminal unit using the TDMA/TDD method which can connect with the base station for every zone. When the synchronization can be taken in two or more base stations, in case a handover is carried out, receiving level degradation and receiving quality degradation are judged. The change place base station prehension step which performs a logic control channel search in the empty slot which is not used for the communication link of TDMA at the time of a value higher than the receiving input-level value which performs a handover, and catches the optimal change place base station, When a receiving input level becomes a handover effective value, a control channel establishment demand is advanced to the optimal change place base station caught beforehand. By having the changing agency base station release step which releases an information channel with a changing agency base station after control channel assigning in a change place base station, and the change place base station establishment step which performs information-channel establishment in a change place base station Since an information channel with a changing agency base station is released after control channel assigning in a change place base station, the advantageous effectiveness that the hits time amount of an information channel can be further shortened during a communication link is acquired.

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The block diagram showing the migration terminal unit of the TDMA/TDD method by the gestalt 1 of operation of this invention, and the gestalt 2 of operation
[Drawing 2] The explanatory view of operation showing handover actuation of PHS
[Drawing 3] The flow chart which shows the handover operations sequence of PHS
[Drawing 4] (a) The transceiver timing chart of TDMA / TDD method
(b) The transceiver timing chart of TDMA / TDD method
[Drawing 5] The flow chart which shows the handover operations sequence of PHS
[Drawing 6] The block diagram showing the migration terminal unit of the TDMA/TDD method by the gestalt 3 of operation of this invention, and the gestalt 4 of operation
[Drawing 7] The flow chart which shows the handover operations sequence of PHS
[Drawing 8] (a) The transceiver timing chart of TDMA / TDD method
(b) The transceiver timing chart of TDMA / TDD method
[Drawing 9] The flow chart which shows the handover operations sequence of PHS
[Drawing 10] (a) The transceiver timing chart of TDMA / TDD method
(b) The transceiver timing chart of TDMA / TDD method
[Drawing 11] The block diagram showing the migration terminal unit of the conventional PHS in a TDMA/TDD method
[Drawing 12] The explanatory view of operation showing handover actuation of PHS
[Drawing 13] The flow chart which shows the handover operations sequence of PHS
[Drawing 14] (a) The transceiver timing chart of TDMA / TDD method
(b) The transceiver timing chart of TDMA / TDD method
(c) The transceiver timing chart of TDMA / TDD method
[Description of Notations]
1, 2, 3 Base station
4 Digital Network
10 Migration Terminal Unit
11 Antenna Section
12 Wireless Transmitting Section
13 Wireless Receive Section
14 Baseband Processing Section
15 Control Section
16 Synthesizer Section
17 Base Station Information Storage Section for Handovers
18 1st Synthesizer Section
19 2nd Synthesizer Section
20 Switch Section
A-C Speech quality good zone
D-F Handover zone
G-I LCCH search zone

[Translation done.]